

## **REMARKS**

Claims 1-19 are pending in the application. Claims 1-19 are rejected. The Examiner's rejections are addressed below in substantially the same order as in the office action.

### **Comments Regarding the Amendments**

Claim 1 has been amended to include a limitation, "wherein the equivalent ratio between the polyisocyanate and the non-ionic alkyloxylated diol is such that the percentage of free isocyanate groups in the non-ionic -N=C=O blocked polyisocyanates is from 3 to 10 percent." A basis for this amendment may be found in Claim 6 and elsewhere in the application.

### **REJECTIONS UNDER 35 U.S.C. §102**

**Claims 1-3, 6-7, 11, and 13 stand as rejected under 35 U.S.C. 102(b) as being anticipated by Yao, et al., (YOA).** It is the Examiner's position that YAO teaches reversibly blocked non-ionic water dispersible polyisocyanates and a method for their production comprising the reaction of (i) polyisocyanate and (ii) dihydroxy polyether, thereby forming an intermediate having free isocyanate groups which are then masked with (iii) isocyanate blocking agent. The Examiner notes that in particular, (ii) has a structure that corresponds to applicants' non-ionic alkoxylated diol having the (iii) R<sub>1</sub> structure, and based on the stoichiometry of example 1, the isocyanate blocking agent is present relative to the free isocyanate groups in an equivalent ratio of 1.14:1.

The Applicants respectfully traverse the Examiner rejections under §102. Claim 1 has been amended to include a limitation also found in claim 6, namely that the equivalent ratio between the polyisocyanate and the non-ionic alkyloxylated diol is such that the percentage of free isocyanate groups in the non-ionic -N=C=O blocked polyisocyanates is from 3 to 10 percent. The specification of YAO is silent in regard to the free isocyanate groups. However, by calculating the ratio of the isocyanate and D1, it is clear that the percentage of free isocyanate groups in the oligomer is 15.6%. This is substantially higher than that of Claim 6 and the newly amended Claim 1. It follows then that Claims 1 and 6 and all of their dependent claims are outside of the scope of the YOA reference and are not anticipated.

## REJECTIONS UNDER 35 U.S.C. §103

Claims 1-3, 5-7, and 11-14 stand as rejected under 35 U.S.C. 103(a) as being unpatentable over Baumbach et al ('536) in view of Buter et al (WO 97119120) or in the alternative Ishiyama et al. ('867). It is the Examiner's position that BAUMBACH teaches blocked non-ionic water dispersible polyisocyanates and a method of making them comprising the reaction of (i) polyisocyanate and (ii) ethylene oxide based dihydroxy polyether, thereby forming an intermediate having free isocyanate groups which are then masked with (iii) isocyanate blocking agent. The Examiner emphasizes that (iii) consist of butanone oxime and 3,5-dimethylpyrazole, and are present relative to free isocyanate in an equivalent ratio ranging from 1.09: 1 to 1 : 1.1 and that the resulting blocked polyisocyanate is then dispersed in water resulting in a solid's content as low as 20 wt%. The Examiner acknowledges that the Patentees fail to teach compounds corresponding to the claimed non-ionic alkoxylated diol.

The Examiner cites BUTER as teaching water dispersible compounds that comprise the reaction product of a polyisocyanate and an ethylene oxide based dihydroxy polyether, wherein said polyether provides hydrophilicity to the resulting oligomer. The Examiner states that polyethers have structures which correspond to applicants' claimed non-ionic diol. The Examiner concludes it would have been obvious to one of ordinary skill in the art to include the dihydroxy polyethers of BUTER in BAUMBACH since the polyethers of BUTER satisfy the requirements set forth by BAUMBACH at column 3 lines 45-49, and it is *prima facie* obvious to add a known ingredient for it's known function.

The Examiner cites ISHIYAMA for similar reasons and it would have also been obvious to include the polyether of ISHIYAMA in BAUMBACH based on the same logic as was set forth for Butler. The Applicants respectfully traverse the Examiner's rejection of Claims 1-3, 5-7, and 11-14 under §103. The non-ionic blocked polyisocyanate of BAUMBACH are obtained by reacting a polyisocyanate a) with components: b) blocking agent, c)stabilizing agent having 1 or 2 hydrazide agents and d) component having a polyether chain. The resulting blocked polyisocyanate contains from 0.1 to 0.3% of chemically bound hydrazide (col. 2, 48-50).

By including the dihydroxypolyethers of BUTER or ISHIYAMA in the BAUMBACH formulation, one of ordinary skill in the art would not obtain the aqueous dispersions of amended claim 1, nor the process of amended claim 6. In the non-ionic blocked polyisocyanate of the present application as defined by amended claim 1, the amounts of components used in the applicants formulation are such that all -NCO groups are blocked (equivalent ratio of the isocyanate groups and the blocking agent is from 1:1 to 1:1.2). The result is there are no -NCO groups that would be available for the reaction with the hydrazide component c). One of ordinary skill in the art would not incorporate the dihydroxypolyethers of BUTER or ISHIYAMA because that would defeat or nullify the stabilizing properties which were a claimed object of .

As a matter of fact, by using the non-ionic alkoxylated diol of formula I in the defined amount in the present application, no stabilizer can be chemically bound. Advantageously, it is also not needed. It follows then that the these claims are not obvious over the Examiner's art.

**Claims 4, 8-10, and 15-19 stand as rejected under 35 U.S.C. 103(a) as being unpatentable over Baumbach et al ('536) in view of Buter et al (WO 97119120) or in the alternative Ishiyama et al ('867) in further view of Reiff et al ('737). The Examiner's rejection of these dependent claim elements was built upon the premise that the Independent claims were obvious over the combinations of BUTER or ISHIYAMA with BAUMBACH. Since the independent claims are not obvious as just argued, then these claims are similarly not obvious.**

**Claims 1-3, 5-7, and 11-14 stand as rejected under 35 U.S.C. 103(a) as being unpatentable over Jonderko et al (200210061999) in view of Buter et al (WO 97119120) or in the alternative Ishiyama et al ('867).** It is the Examiner's position that JONDERKO teaches reversibly blocked non-ionic water dispersible polyisocyanates and a method of their production comprising the reaction of (i) polyisocyanate and (ii) ethylene oxide based dihydroxy polyether, thereby forming an intermediate having free isocyanate groups which are then masked with (iii) isocyanate blocking agent. The Examiner further states that component (i) is reacted with (ii) at 60°C, then reacted with (iii) in the presence methyl ethyl ketone solvent, wherein (iii) consist of dimethyl pyrazole and methyl ethyl ketoxime, which is chemically synonymous with butanone oxime claim and that (iii) is present relative to the free NCO groups in a slight stoichiometric excess, which is taken to satisfy the

claims 6 and 13 (Paragraph 40). The Examiner acknowledges that JONDERKO fail to teach the claimed dihydroxy polyether.

The Examiner cites BUTER for teaching water dispersible compounds that comprise the reaction product of polyisocyanate and ethylene oxide based dihydroxy polyether, wherein said polyether consists of the same compounds claimed by applicants. The Examiner concludes that it would have been obvious to one of ordinary skill in the art to include the polyethers of BUTER in JONDERKO since they are disclosed by BUTER as being suitable for rendering an analogous composition hydrophilic and it is *prima facie* obvious to add a known ingredient for it's known function. The Examiner cites ISHIYAMA for the same reasons.

The Applicants respectfully traverse the Examiner's rejections. BUTER does not teach or suggest that the alkoxylated diols of formula I confer stability to the aqueous dispersions of the non-ionic blocked polyisocyanates of the invention. Further, the Applicants respectfully disagree with the Examiner's statements that "the polyethers (of BUTER) consist of polyethers 1,3-propanediols." Such compounds are included in a list, all components of which are defined as "non limiting examples of suitable compounds". (Buter, page 3, lines 1-11)

Another problem with the Examiner's art combination is that the BUTER products are polyurethanes and not blocked polyisocyanates. Ionic groups (sulphonic acid salt groups) are necessary to render the polyurethane of BUTER water dispersible (i.e., they are ionic polyurethanes). One ordinary skilled in the art would have not looked in BUTER for a polyether suitable to render the non-ionic polyisocyanate of JONDERKO water dispersible. The same argument applies equally to the combination of Jonderko with Ishiyama, since also the polyurethanes of Ishiyama comprise ionic functional groups. It follows that the claims are not obvious under this combination of art.

**Claims 4, 8-10 and 14-19 stand as rejected under 35 U.S.C. 103(a) as being unpatentable over Jonderko et al (200210061999) in view of Buter et al (WO 97119120) or in the alternative Ishiyama et al ('867) and in further view of Reiff et al ('737). The Examiner's rejection of these dependent claim elements was built upon the premise that the Independent claims were obvious over the combination of JONDERKO with BUTER or ISHIYAMA. Since the independent claims are not obvious as just argued, then these claims are similarly not obvious.**

### **CONCLUSION**

The Applicant respectfully asserts that all rejections have been overcome and an allowance of all claims is requested.

It is believed that no fee is due for this paper. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. **13-0010 (LSP-1011US)**.

Respectfully submitted,

Dated: February 2, 2009

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